Chapter 4

Success Stories

While the scope of the Department of the Navy's cleanup efforts has been extensive and was made more complex by the ongoing operational nature of the sea service mission, the results have been impressive. Through early and continuing coordination and cooperation with federal and local regulators, non-governmental organizations, cleanup contractors, and community representatives, the Navy is successfully working to restore the future.

In the following pages we look at just a few of the many success stories: Naval Air Station North Island, California; Naval Air Engineering Station, Lakehurst, New Jersey; Naval Air Station Patuxent River, Maryland; and Naval Air Station Whidbey Island, Washington.

Naval Air Station North Island, CA

History

Naval Air Station (NAS) North Island was established November 17, 1917, and is the largest aviation industrial complex on the West Coast. Host to two aircraft carriers, 24 squadrons, and 50 other tenant commands, its primary mission is to provide aviation support services to the fleet, including aircraft maintenance, aircraft operations, pier side services, and logistics support. Approximately 24,700 people work aboard the air station which occupies 2,803 acres with 489 buildings. It also operates two other airfields: Naval Auxiliary Landing Field (NALF) San Clemente Island, located 70 miles northwest of San Diego, and Naval Outlying Landing Field (NOLF) Imperial Beach, located next to the U.S. - Mexico border.

NAS North Island is located in San Diego County, California, on the tip of the Silver Strand peninsula and adjacent to the City of Coronado. It is surrounded on three sides by water with the Pacific Ocean on the south, San Diego Bay on the north, and the inlet from the Pacific Ocean to San Diego Bay on the west. Land uses to the east of the air station are primarily residential and commercial.

Past Practices

Since 1917, NAS North Island has supported aviation activities of the Naval Operating Forces. During the operation and maintenance of aircraft, hazardous wastes were generated. These included paint, used oil, scrap metal, solvents, and contaminated rinse water. They were commonly disposed of on site. Chemical wastes such as solvents, acids and paint residues were previously disposed of at an on-base chemical waste disposal site. Trash and other solid wastes were disposed of at the Spanish Bight Landfill until 1942, and at the golf course disposal area until 1965. Hazardous wastes are now managed through the Public Works Center and disposed of at appropriate off-site facilities. In 1972, the Navy constructed a treatment plant to treat industrial wastewater before discharge to the sanitary sewer system.

Environmental Leadership

In 1993, the base was designated by the Chief of Naval Operations as one of two installations in the Navy Environmental Leadership Program (NELP). This program focuses on demonstration of innovative environmental technologies and finding new and innovative ways to manage environmental programs. Successful technologies and management methods are exported to other Naval facilities.

Environmental cleanup is especially challenging at NAS North Island due to the variety of contaminants and conditions, the complex regulatory framework, and active public interest. These challenges have been met through strong teamwork, partnerships, and proactive community involvement.

In April 1997, the air station was presented the 1996 Secretary of Defense Environmental Security Award for Cleanup by Secretary of Defense William S. Cohen. The award recognized NAS North Island's Installation Restoration Program accomplishments over the preceding two years as the most outstanding of all Department of Defense activities.

Restoration Challenges

Cleanup activities include programs at NAS North Island, NALF San Clemente Island, and NOLF Imperial Beach. The highest relative risk areas are found at the air station, where the cleanup team members manage 12 Installation Restoration sites. Environmental hazards include PCBs which leaked into the soil from electrical transformers; radium-contaminated smelter slag and soil, some of which was discharged along the shoreline; contaminated soil and groundwater due to the disposal of several million gallons of chlorinated solvents and other chemical wastes; contaminated shoreline sediments from past hazardous waste discharge through outfall pipes; and closed landfills with both soil and groundwater contamination. The most contaminated site is located near the air station's Weapons Compound, presenting a unique challenge. All site cleanup activity is closely coordinated with the Weapons Department and on-site work is scheduled to avoid conflict with military operations.

Partnering Leads to Success

The air station's cleanup program is managed using a partnership approach. Partners include Navy personnel, community representatives, regulatory agencies, and cleanup contractors. The partnership uses the NELP Management Team to act as its "focus group" and action agent. The NELP team then identifies and conducts innovative cleanup technology demonstrations that will have broad application Navy-wide at reduced costs.

Effective teaming with other environmental programs is an essential element of the NELP initiative. One example is NAS North Island's relationship with the EPA and its Superfund Innovative Technology Evaluation (SITE) program. The EPA established the program to speed up the development, demonstration and use of new or innovative technologies to be used in site cleanups. Typically, the technologies EPA selects for field demonstrations will already have been tested at the laboratory or bench-scale level. The main objective is to develop reliable performance and cost data on the innovative technologies. EPA needs suitable sites to achieve the program's goal and the Navy has been able to provide several ideal sites.

Perhaps the most notable success in implementation and technology transfer was a soil washing technology, originally demonstrated in 1994.

This closed-loop batch process uses a solvent to remove contaminants from soils, sediments, sludge and debris. The resulting PCB-saturated solvent is passed through a purification unit to remove the PCBs. Cleaned solvent is re-used to wash more contaminated soil, and the remaining PCB-contaminated material is taken off site for proper disposal at a permitted facility. The process resulted in a dramatic decrease in the volume and mass of material taken off site.

NELP program demonstration of a soil vapor extraction process at Site 9 on NAS North Island

Soil washing by solvent extraction performed at NAS North Island IR Site 4. Here, molecular sieves remove PCBs from the solvent before reuse.

The subsequent full-scale cleanup of 5,400 cubic yards of PCB-contaminated soil at NAS North Island helped the technology developer successfully obtain the first EPA nationwide permit for a mobile, on-site, non-thermal PCB cleanup system.

This innovative cleanup technology at NAS North Island saved the Navy and taxpayers more than $3.5 million, compared to the conventional dig and haul method typically used to dispose of PCB-contaminated soil. It also eliminated future liabilities associated with landfill disposal of PCBs. Since treatment was conducted on site, it has resulted in 700 fewer truck trips through the City of Coronado, NAS North Island's neighbor community.

Another success was the cross-flow pervaporation technology demonstrated at the former chemical waste disposal area on the base, Site 9. The objective was to evaluate an alternative approach to treat organic-contaminated groundwater at sites where conventional air stripping or carbon adsorption might be used. The demonstration showed this technology significantly reduced TCE concentrations in groundwater with an average removal efficiency of 99.3%. The cost per 1,000 gallons of contaminated water treated was estimated to be $29.00 or about three cents per gallon. The advantage of pervaporation over conventional treatment methods is that the pervaporation membrane (the filter) typically does not require frequent replacement and disposal. The manufacturer asserts that the membrane can be used for years before it requires replacement.

Cross flow pervaporation demo Site 9 NAS North Island

In addition to partnering with regulators and contractors, the air station has an excellent community relations program, with most community involvement coming through the Restoration Advisory Board. This board is one of the earliest established and most active. It meets regularly and reviews and comments on technical documents and plans relating to ongoing environmental cleanup activities at NAS North Island. It makes recommendations and serves as a key factor in achieving success.

A soil/sludge drying station capable of drying four bins at a time is a part of the soil washing process at NAS North Island IR Site 4

> *"On behalf of the NAS North Island Restoration Advisory Board, I would like to congratulate you and all the people involved in the clean-up of radioactive slag on the shoreline..we were impressed at the Navy's quick response to the clean-up and with the Navy's openness in explaining to the public what was happening..it is obvious that the Navy cares about public involvement in the clean-up process."*
>
> *— From a September 7, 1995, letter to the Commanding Officer by Ms. Dottie Marron, the NAS North Island Restoration Advisory Board Community Co-Chair*

Since the board's inception in 1994, RAB members have sought independent technical analyses of the Navy's Installation Restoration program plans and proposals. Because the air station is not on the EPA's National Priorities List, community members could not get EPA funding for such analyses. In 1997, NAS North Island launched a pilot program as an innovative management initiative under the Navy Environmental Leadership Program Charter. Using the draft Technical Assistance for Public Participation (TAPP) regulations as a guide, the Navy offered to fund a program. The RAB formed a technical assistance committee to refine needs and develop statements of work. The entire process, including technical assistance provider selection, was done as a team effort by the Navy and RAB members. Subsequently, the Navy awarded four technical assistance contracts to small businesses. The TAPP pilot's focus is to demonstrate leadership and improve community acceptance and approval of the air station's restoration activities.

> *"Through the pilot TAPP, we've worked closely with community members toward a better understanding of the restoration process..already, we believe our effort has fostered teamwork and trust with the community and RAB members."*
>
> *— Arno Bernardo, Navy Co-Chair of the Restoration Advisory Board at NAS North Island*

Lakehurst Naval Air Engineering Station, NJ

The Situation

Naval Air Engineering Station (NAES) Lakehurst covers nearly 7,400 acres of gently rolling terrain on an outer coastal plain located in southcentral New Jersey. The station is 14 miles inland from the Atlantic Ocean, 65 miles south of New York City, and 50 miles east of Philadelphia. It is bordered by Fort Dix to the west, Route 547 to the east, and woodland to the north and south.

NAES Lakehurst and the surrounding areas fall within the Pinelands National Reserve, the most extensive undeveloped land tract on the Middle Atlantic Seaboard. The Pinelands cover over 1.4 million acres, about 30% of the state. There are rare, threatened, and endangered species within the Pinelands ecosystem. Lakehurst sits atop sandy soil over the largest aquifer in the northeast United States, a major source of drinking water. Drainage from Lakehurst discharges to several tributaries which flow into two major streams, the Ridgeway Branch along the station's northern border and the Manapaqua Brook along the south. Both flow into Pine Lake which discharges into the Toms River.

Historical Review

The Army began operations at Lakehurst in 1917. Later, the Navy took over and the station became the home of several aircraft squadrons and the Navy's rigid lighter-than-air aircraft (dirigibles). (Lakehurst is famous as the site of the fiery crash of Germany's Hindenburg zeppelin in 1937). The station's current mission is naval aviation technology development and engineering.

Past operations included handling, storage, and on-site disposal of hazardous substances. Investigations to determine the extent of possible contamination at Lakehurst took place between 1980 and 1984. Historical records, field inspections, aerial photographs and interviews were used to identify 45 potentially contaminated sites. Contaminants included acids, fuels, PCBs, pesticides, herbicides, photographic chemicals, refrigerants, solvents, waste oils, and unexploded ordnance. Primary contaminants were petroleum products in soil and volatile organic compounds in groundwater.

Cleanup Challenges

Lakehurst was placed on the EPA's National Priorities List of contaminated sites in 1987. The base was divided into several areas for cleanup. Four are being treated for groundwater contamination, one is being studied for natural attenuation (which makes use of already occurring processes in nature to keep contamination from spreading and to lower the concentration of pollutants), and three are being monitored for contamination. Contaminated soils, drums, tanks and debris have been removed from 23 sites. Thirty-two of the original 44 sites have been addressed and are no longer a concern. The remaining sites are monitored or have systems in place which are removing contamination. Lakehurst's goal is to be "delisted" (taken off the EPA National Priorities List) by 1999.

Over the years, a number of innovative cleanup technologies have been used including bioremediation, soil washing, and asphalt batching of contaminated soil (which involves combining contaminated soil with an emulsion to create a base for roads). Passive soil gas surveys have also been conducted to identify the most contaminated areas in a closed landfill and the extent of petroleum contamination in a wetland.

Lakehurst sits atop an estimated 17 trillion gallon aquifer which is the principle source of water for much of New Jersey. A valuable resource to everyone, the groundwater must be carefully managed. This groundwater is replenished by rain. About half of the 45 inches of annual rainfall returns to the groundwater, with the remainder running off into streams or returning to the atmosphere through surface evaporation or transpiration.

In 1992, NAES Lakehurst was named the Navy demonstration site for in-house groundwater modeling. The station developed a three-dimensional groundwater flow model to show the performance of four existing groundwater recovery and treatment systems. The model predicts the movement of contaminated groundwater and shows how the contaminated groundwater is affected by changing pumping locations and rates. If necessary, the treatment systems are modified based on the results predicted by the model.

Lakehurst also uses its Environmental Engineering Information System (ENVEIS) — a combination of a geographic information system (GIS), modeling, and 3-D visual display software — to model the station's remediation of volatile organic compounds in groundwater. Projections from this system have also helped build consensus for using natural attenuation as the proposed cleanup action for a large industrial solvent plume, an option that would cost less than one percent of the cost of traditional pump-and-treat systems.

The Station hosts an environmental summer camp which focuses on the natural resources and the environment. Students learn about grassland birds, perform radio tracking of snakes, and conduct surface and groundwater sampling for contaminated site restoration projects. Here the students help clean up old lumber in a wetland area on the base (an area which is a known habitat for the bog turtle, a threatened species).

Partnering, Teaching, and Community Involvement

NAES Lakehurst has established strong working relationships with community members and nearby schools, and partnerships with federal, state and local organizations including the EPA, the U.S. Geological Survey, the New Jersey Department of Environmental Protection, and the Pinelands Commission.

"Lakehurst is a good example of the community, the regulators, and the Navy getting together in a nonconfrontational way realizing we have a mutual goal. Once we realized we had a mutual goal — cleaning up the environment at Lakehurst — we were able to get down to business and enter into a more trusting relationship. Once we all trusted each other, we felt more free to be frank in discussions which helped get the job done."

"For example, we were able to agree we could initiate interim actions. Specific (cleanup) levels were not set. We could see how the action performed. It would have taken a lot longer if we had to go through bureaucratic hurdles. We knew there was a problem and we knew what had to be done. We did the work up front, so cleanup levels became moot. We went straight to action we knew would work, then monitored it. It saved a lot of time and money."

"People can make or break a project. The people at Lakehurst are very enthusiastic. They really make a difference."

— Jeffrey Gratz, Superfund Project Manager, U.S. EPA Region 2

NAES Lakehurst and a local high school developed a summer science program called Research Methods in Ecology and Environmental Sciences. The program is designed to encourage and nurture student careers in science and ecology, while providing valuable information for the station. Students work side by side with environmental professionals on guided research projects.

An NAES environmental engineer demonstrates a groundwater model to students at Earth Day '97 exhibition.

In 1987, a Technical Review Committee was established to discuss the status of the National Priorities List sites. This committee meets monthly and includes members of the Navy, EPA, New Jersey Department of Environmental Protection, and the Pinelands Commission. A Restoration Advisory Board (RAB) was established in November 1994. Meetings are held every other month and all members of the public are invited to attend.

"When I first got involved in the issue in 1987, there was no community group like the RAB. Cleanup at Lakehurst was ongoing and you would read about it in the papers, but you didn't have a lot of knowledge. Now when you want answers, you can go to RAB meetings. If there's anything going on at the base, you can go at the scheduled time and talk to base personnel actually involved in it. There are always quite a few members of the NAES Lakehurst staff there — people actually involved in the cleanup. They give detailed answers to questions. It's gotten the public positively involved. Having this very important interaction has stopped a lot of misinformation."

"Not only do you find out about cleanup operations on the base, you also find out information about what's happening in the community. RAB meetings provide a great opportunity to speak individually with people with expertise in this area."

"The people from NAES Lakehurst are very involved, they live here, and they give back to the community. That's reassuring. When you want answers to your questions, you want to hear from someone who lives here and will be here in the future. This forum provides great back-and-forth interaction."

— Theresa Lettman, Community Co-Chair of Lakehurst Restoration Advisory Board and member of the Pinelands Preservation Alliance

Award Winner

NAES Lakehurst has received numerous awards for its cleanup efforts, including the Chief of Naval Operations Environmental Cleanup Award, the New Jersey Leaders in Environmental Excellence Award for Education/Outreach, the New Jersey Society of Professional Engineers Professional Development Award, and has been designated a Department of Defense Environmental Showcase Installation.

Natural Restoration of Groundwater

A large plume of volatile organic compounds was slated for cleanup by traditional pump-and-treat technology in 1993. But in 1994, during groundwater modeling of the site, it was found that pumping the plume might damage over 80 acres of wetlands downgradient of the plume. The same modeling showed that active treatment would achieve cleanup levels in 75 years, while natural attenuation of the plume would achieve the same cleanup levels in 80 years. The potential damage to the wetlands prompted the Pinelands Commission to question the already accepted pump-and-treat remedy. Working with the EPA and the New Jersey Department of Environmental Protection, the Navy pursued a revised Record of Decision for Natural Restoration of the site. The use of natural restoration at this site is expected to save over $40 million in construction, operation and maintenance costs.

Asphalt Batching

At several NAES Lakehurst sites, the primary soil contaminant has been petroleum hydrocarbons from past jet fuel releases. These soils were excellent candidates for an innovative and inexpensive technology called cold-mixed asphalt batching. The process consists of mixing the contaminated soil with aggregate and a water-based asphalt emulsion to produce asphalt for road base material, saving 50% to 70% of costs compared to incineration. The asphalt was mixed on station by a portable unit. After an initial indoor demonstration to obtain air permit information, the process was approved for soil at six of the station's sites. This cold-mix product was used to pave more than four miles of existing dirt roads on the base. A top layer of hot-mix asphalt was applied to comply with Department of Transportation specifications and to serve as a protective cap.

Solar Power for Groundwater Remediation

NAES Lakehurst also uses the sun to clean up groundwater. At two locations in Area K near the recovery end of test tracks, groundwater has been contaminated with chlorinated solvents. There, a solar panel powers a three-gallon-per-minute pump. Water is pumped from a well to a sprayer, where air is bubbled through it. This treatment is known as aeration. West of the Seabee Compound, seven solar panels run a one-horsepower blower. The blower provides air to 10 one-inch diameter screens set below the groundwater table within a wetlands. This system aerates contaminants and speeds up biological remediation of the area.

Naval Air Station Patuxent River, MD

History

Naval Air Station (NAS) Patuxent River is located 65 miles southeast of Washington, DC, at the confluence of the Patuxent River and the Chesapeake Bay in St. Mary's County, Maryland. It was established during the expansion of military aviation after World War I. By 1939, five Navy testing facilities had emerged, each attempting to gather aircraft performance data. The air station was commissioned in 1943 after the Bureau of Aeronautics consolidated the facilities into a central site for conducting aircraft test programs. NAS Patuxent River is now the Navy's premiere aircraft research, development, test and evaluation facility.

The 7,745-acre complex has five runways (the longest is 11,800 feet), 10 double-bay hangars (one of which was designed and constructed to support highly classified aircraft), three seaplane basins, 8.5 million square feet of facilities, 942 buildings, 58 miles of roadway, and 25 miles of shoreline. The facility is valued at over $1.9 billion. The complex supports 140 aircraft, with a surge capacity of 300 aircraft. Five thousand square miles of controlled airspace and 780 square miles of restricted airspace are available for operations.

The Air Station Today

NAS Patuxent River became a gaining installation as a result of decisions made by the Base Realignment and Closure (BRAC) Commission. It absorbed several thousand workers when the headquarters of Naval Air Systems Command, Arlington, VA, moved, and when the Naval Air Warfare Center Aircraft Divisions at Trenton, NJ, and Warminster, PA, closed as required by the BRAC commission. The working population aboard the air station is 17,500 people. The unincorporated community of Lexington Park lies immediately southwest of the air station. St. Mary's County is rural and has a population of 85,000. Land use patterns are largely residential, agricultural, and undeveloped open space.

The air station lies on a moderately flat peninsula within the Atlantic Coastal Plain. Elevations on-station range from 0 to 120 feet above mean sea level. Several small streams drain portions of the base. There is a fairly extensive storm sewer system that is composed of 18 drainage basins with discharge points on the Patuxent River, the Chesapeake Bay, and various ponds and small lakes. The storm water collection system consists of reinforced concrete storm sewers receiving surface water and groundwater seepage from a network of shallow roadside ditches, natural streams, culverts, subdrains, and storm sewers. The Aquia Formation aquifer is the principal groundwater source for the air station as well as for most public supply wells in the surrounding area. It is located approximately 400 to 600 feet below mean sea level.

Operations Past and Present

Basic operations at NAS Patuxent River include the testing and evaluation of aircraft weapons systems, fixed-wing antisubmarine aircraft and experimental and production fixed-wing attack, fighter and other aircraft. Intermediate aircraft maintenance is also conducted, as are operations, maintenance and improvement of existing facilities, grounds, and utility plants and systems; and procurement and distribution of fuel, oil, chemicals and other supplies. In the past, typical air station operations that contributed to contamination included machine shops, foundry, coatings and paint shops, paint stripping, plating shops, power plants, wastewater treatment plants, fire fighting, landfill disposal, and storage of supplies, materials, fuels and ordnance.

In 1982, investigations began to find out the extent of contamination. Forty-six Installation Restoration sites were eventually identified and are being addressed. Primary contaminants are pesticides, solvents, PCBs and metals found in soil, groundwater, sediment and surface water. Remedial Investigation/Feasibility Study activities began at several sites in 1985. In 1994 the EPA placed NAS Patuxent River on its National Priorities List due to groundwater contamination at the landfills and high concentrations of pesticides in the soil and sediment at the Pest Control Shop. Presently, 16 sites are under evaluation as part of Remedial Investigation/Feasibility Study activities and five additional sites are undergoing a Site Inspection. Interim cleanup and removal actions have taken place at several sites.

The air station is using several innovative approaches and technologies in its cleanup program. One such technology is its Geographic Information System. This computerized system is used to store spatial (mapping) information. That spatial information is derived from satellite imagery, aerial photography, Global Positioning System data, existing maps and other sources, and is tied to databases. At NAS Patuxent River, the Geographic Information System has 150 different data layers. With it one gets a view of everything you can see (roads, trees, buildings, etc.) down to the things you don't see (archaeological sites, threatened and endangered species sites, contaminated sites). It provides a very thorough picture and three-dimensional view of the air station and its cleanup challenges.

Restoration Advisory Board Contributes to Cleanup Successes

In 1990, the air station formed a Technical Review Committee, which was converted to a Restoration Advisory Board in 1994.

"Our role as RAB members is to advise and be a link with the community. The board is representative of people from the community. We work on a round-table basis with base representatives, the EPA, and the Maryland Department of the Environment. I've attended meetings where suggestions were made and adopted, which led to solutions to serious problems."

"For example, some time ago there was a problem with one of the former installation restoration sites. An underground mixture of oil and water had to be evacuated. The problem was that the underground piping that had been installed to collect the contaminant had collapsed under the weight of the soil. One solution was to dig up the whole thing and start all over. But that option was very expensive. We all brainstormed at this roundtable meeting and a suggestion was made that instead of putting perfo-

rated pipe underground, to put an evacuation piping system on the surface and place probes into the soil. Basically the contaminant could be sucked up without worrying about the pipe collapsing. The suggestion was adopted."

"I'm astonished at the amount of work being done at this base. Another great thing has been working with all of the base commanding officers. They have all taken this entire process very seriously, which makes it very worthwhile for RAB members."

— George Donely, member of the Restoration Advisory Board at Naval Air Station Patuxent River

Restoring the Land, Restoring the Future

As NAS Patuxent River's importance as a Naval aviation center grew, so did the awareness that the land on which it resides must be restored and enhanced to ensure its future viability. Air station personnel have been committed to this task and have aggressively pursued cleanup actions from the beginning. Their ongoing efforts have netted very positive results, as can be seen from two examples.

Fishing Point Landfill (Site 1):

The 25-acre Fishing Point Landfill sits just up river from the Chesapeake Bay along the Patuxent River. Surface elevation ranges from sea level to 40 feet above mean high tide at the site's eastern corner. The area consists of flat, low-lying meadow, wetland, and a wooded area. From 1960 to 1974, Fishing Point Landfill served as the air station's main disposal area. An estimated 54,350 tons of solid wastes and 121 gallons of liquid wastes were disposed of there. Wastes included construction debris, sewage treatment plant sludge, paints, paint thinners, solvents, antifreeze products, photographic wastes, petroleum-oil lubricant products, pesticides, residue from open burning of various liquid wastes and miscellaneous station wastes

Beginning in 1982, several studies were conducted. Monitoring wells were installed and, over time, groundwater and monitoring well samples were taken and analyzed. By the early 1990s, the Fishing Point beach was eroding away and landfill debris was exposed. In 1994, the air station's Environmental and Natural Resources Division, working with the University of Maryland, undertook a shoreline protection project that was designed to reclaim the original shoreline.

Stone breakwaters were erected just off-shore and clean sand was brought in to reconstruct the beach area. The huge stones absorb wave energy and allow silt and sand to settle along the shore, enlarging the beach. In 1997, to further control erosion, volunteers from the Earth Conservation Corps, the Maryland Conservation Corps, and the air station planted 50,000 American Beachgrass plants and 28 rows of Panic Grass seed along Fishing Point beach. The two plants working together provide the

best erosion protection for the beach. This project was supervised by the Alliance for the Chesapeake Bay which provided experts to help educate the volunteers during the planting.

"The beach area had been eroding for some time, so much so that some of the refuse was exposed. I would consider this a success story because it rebuilt the beach and reduced a potential health threat."

— Mike Angerman, geologist, Maryland Department of the Environment

Former Sanitary Landfill (Site 11):

The Former Sanitary Landfill is one-and-one-half miles southeast of the main entrance (gate 2) near the southern edge of the installation next to the intersection of Maryland State Route 235 and Hermanville Road. It covers approximately 6.5 acres and surface elevations range from 85 to 110 feet above mean sea level.

From 1974 to 1980, the site was used as the main disposal area for the air station. An estimated 22,500 tons of plastic and paper trash and 43 tons of oil-contaminated soils and liquids were disposed of there. The liquids included petroleum-oil lubricants, paint, paint thinners, solvents, antifreeze products, pesticides, and photographic chemicals. The liquid wastes were mainly residues left in cans, rags and absorbents.

In 1985 four monitoring wells were installed and sampling and analysis of groundwater was conducted. Soil, sediment, and surface water were also sampled and analyzed for metals, volatile organic compounds, and total organic carbon. In 1989 and 1991, more samples were collected and analyzed.

Capping of the Former Sanitary Landfill began in 1996 and was completed in 1997. The cap cover consists of 12 inches of common soil, followed by a geomembrane, then a geocomposite drainage layer, then nine inches of drainage sand, then nine inches of fine sand for a filter layer, and finally six inches of topsoil as a vegetative anchor. Soil for the landfill cap came from construction sites at the air station, thus eliminating costs for off-site purchase and transport.

"Working with the air station cleanup team has been very beneficial. At Site 11 they used soil from the base. By using common sense they helped to save the government a considerable amount of money."

— S. Andrew Sochanski, Remedial Project Manager, U.S. EPA Region 3.

"The cleanup work at the Former Sanitary Landfill, Site 11, is a textbook case of what can be accomplished. The work has been well thought out and very carefully conducted. It's being done by the book. It's a joy to work with the people at this base."

— George Donely, member of the Restoration Advisory Board at Naval Air Station Patuxent River

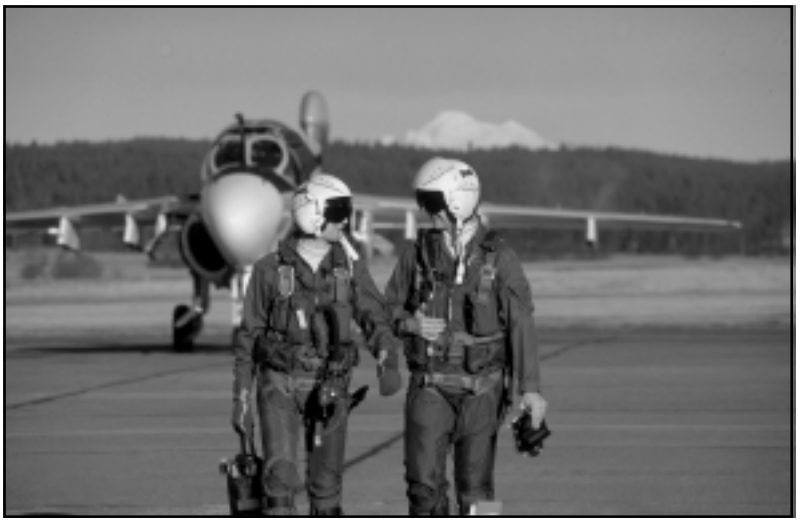
Recognized for Excellence

Naval Air Station Patuxent River has received numerous awards including the Secretary of Defense Environmental Quality Award, the Secretary of Defense Natural Resources Conservation Award, the Secretary of the Navy Environmental Quality Award, the Secretary of the Navy Natural Resources Conservation Award, the Maryland Historic Preservation Award, the Renew America Award/Oceans and Coasts, the Secretary of the Navy Cultural Resources Conservation Award, and the National Arbor Day Foundation Tree City USA Award.

Naval Air Station Whidbey Island, WA

Prowler Country

In 1940, the Navy began searching for a location to establish a re-arming base for patrol planes operating in defense of the Puget Sound area. In 1941, Congress appropriated $3 million for construction of a naval aviation installation on Whidbey Island. In September 1942, Naval Air Station (NAS) Whidbey Island was established.



NAS Whidbey Island is home to all Navy EA-6B "Prowler" Tactical Electronic Warfare Squadrons. These are the only airborne electronic countermeasure units in the Department of Defense to be jointly operated by a Navy/Air Force team. In addition to the EA-6B squadrons, there are six P-3 Orion squadrons, which perform the bulk of the Pacific Fleet's long-range anti-submarine and maritime surveillance missions. Seven Navy DC-9/C-9B transport squadrons are also home based at the air station, training Naval reservists for recall and mobilization while simultaneously providing transport aircraft services for Navy airlifts. There are 54 tenant commands, and more than 8,000 active duty and 2,100 civilians work aboard NAS Whidbey Island.

NAS Whidbey Island is located about 80 miles northeast of Seattle and has two mainland areas, Ault Field and the Seaplane Base, totaling about 7,500 acres. Both are located near the town of Oak Harbor (population 15,000) on Whidbey Island. Ault Field, which has two 8,000-foot-long intersecting runways, is the main operational component of the station with the bulk of the operational, training, maintenance, and administrative facilities. The Seaplane Base, located three miles southeast of Ault Field, serves as a commercial and residential support center for the station. NAS Whidbey Island also controls two remote facilities on the island. Outlying Field (OLF) Coupeville, located 20 miles south of Ault Field, is used for carrier landing practice and emergency landings. Lake Hancock, located 10 miles south of OLF Coupeville, is an inactive and inert bombing range (used in the 1940s and 1950s).

Whidbey Island has a mild temperate climate, coniferous forests, and low commercial development. Most of the island is in a natural state. A drinking water aquifer underlies the air station and is the sole source of water for most of rural Whidbey Island. The beaches and bays around the island are popular fishing and shellfish gathering areas.

Past Practices Result in Need for Cleanup

In 1984, investigations began to find out the extent of contamination from 42 years of operations. Fifty-three potential sites were identified. Past disposal practices, and past operations involving aircraft maintenance, vehicle maintenance, the public works shop, and fire fighting training, resulted in contamination in several areas which affected groundwater, surface water, sediments, and soil.

In 1987, the cleanup program began and a Technical Review Committee was established. In 1990 the Seaplane Base and Ault Field were placed on the EPA's National Priorities List due to the extent of the contamination. Contaminants included large quantities of petroleum products, solvents, paints, thinners, jet fuel, pesticides, and other wastes.

Bird nestboxes at Pesticide Rinse Area were erected as part of a toxilogical demonstration project to study potential uptake of contaminants through local bird population food chain. Ecological risk assessment showed the area was clean.

The Navy, the EPA, and the State of Washington Department of Ecology signed a Federal Facilities Agreement later in 1990 which led to further Navy study of the contamination and actions to remove it. The cleanup at NAS Whidbey Island has been guided by two objectives — to conduct investigations and remediate the affected areas in a timely and cost effective manner, and to inform the public about and involve the public in the entire cleanup program.

Team Approach

NAS Whidbey Island uses a team approach for managing cleanup. Known as "Team Whidbey," it involves dedicated participation in all aspects of the program by everyone involved — Navy, regulators, and the community.

Over the years, the cleanup team has developed working relationships with local, state, and federal regulators which has allowed decisions to be made at the lowest regulatory level. These relationships have allowed the team to agree on streamlining site investigations thereby resulting in cutting Navy and agency review times, meeting schedules and avoiding extensions. Thanks to these partnerships, when problems arise the agencies and the Navy work together closely to find solutions.

In 1993, NAS Whidbey Island became the first Navy installation to establish a Restoration Advisory Board (RAB), replacing the Technical Review Committee. Its purpose was to involve more of the local community in an advisory capacity. Local environmental groups, and city and county agencies were invited to participate. The RAB reviews all proposed Superfund cleanup actions and makes suggestions for improvements and cost savings.

The constructed prairie ecosystem NAS Whidbey Island.

> *"Instead of looking at how to complete each and every job to the nth degree, the RAB tries to look at the relative importance of all the work that needs to be done and recommends a balanced approach to get the work done for the dollars available. As a group of citizens representing a wide spectrum of viewpoints, we have been able to show that this approach has broad support."*
>
> *— Ed Oetken, Community Co-Chair, NAS Whidbey Island Restoration Advisory Board*

The growing partnership between the station and the local community through the RAB has resulted in a degree of trust that allows a free exchange of ideas and information.

> *"The Navy has been very cooperative. The Navy is really leaning over backwards to clean up the area and is doing an excellent job."*
>
> *— Bill White, physicist, member of Beach Watchers and member of NAS Whidbey Island Restoration Advisory Board*

Archaeological evidence suggests that Native Americans occupied Whidbey Island after the last glacial ice age and for the next 8,000 to 10,000 years. Numerous burial grounds and artifacts from this civilization remain. The original co-chair of the Restoration Advisory Board is a member of and spokesperson for a local Native American tribe (the Snoqualmoo) and has brought a unique viewpoint to the cleanup program.

> *"When I began with the RAB, it was my responsibility and duty to cooperate with the Navy and I required that the Navy cooperate with us. We developed a positive working relationship. They avoided intruding upon known burial sites as much as possible and restored as much of the land as possible to its original topography."*

"Right after I became a member of the RAB, our tribe met in council at Deception Pass State Park which is one of our oldest sites and which is right underneath the air station takeoff and landing area. During the day of our conference, no one flew. The base commander had arranged that. In turn, when we asked for blessings on the land, we asked that the young warriors now occupying this space be protected."

— Crowfeather Halsen, president of the Admiralty Inlet Preservationists and first Community Co-Chair of the NAS Whidbey Island Restoration Advisory Board

Challenges and Initiatives

NAS Whidbey Island's "out of the box" thinking and use of new technologies and innovative approaches has resulted in a successful fast track cleanup over much of the affected area.

The first challenge was to characterize the 53 initial sites. The island has a very complex geology with numerous aquifers at varying depths. The cleanup team divided the areas of concern into manageable operable units based on anticipated similar attributes (potentially similar contaminants, similar geographical areas, and similar watershed characteristics). By organizing them in this way, considerable time and cost savings were realized because 53 separate studies were avoided. Of the 53 sites, eight were judged clean, five were transferred to the Underground Storage Tank Program, 14 were grouped into four operable units, and 26 required further investigation. The remaining 26, which the cleanup team anticipated to have little or no contamination, were further evaluated in a Hazardous Waste Evaluation Study. Only two required additional study and were placed into a fifth operable unit.

By moving the Remedial Investigation/Feasibility Study portions of the program to a fast track, "Team Whidbey" has been able to move the cleanup program into the remediation phase in many areas. By 1995, soil excavation activities at the Seaplane Base had sufficiently reduced the threat to human health and the environment that the EPA removed it from its National Priorities List. The State of Washington also removed the Seaplane Base from its Hazardous Sites List. This was the first such delisting for the Navy. In 1997, the U.S. EPA Region 10 declared that Ault Field had reached the "construction complete" phase because all investigations were completed and recovery systems were online and operational.

Beach Watchers working with members of the Station's cleanup team collect marine sediment samples and inventory marine invertebrates.

Innovative Approaches

Among the approaches used to clean up the station, one has been particularly successful — protecting and enhancing natural resources. The cleanup team has avoided wetlands, left trees in place where possible, incorporated erosion control practices, and restored investigated areas. Three small and two large excavation sites have been turned into wetlands, thus producing savings by not having to go off-station to purchase and haul backfill material while simultaneously providing quality habitat for wetland plants and animals. At an abandoned 40-acre landfill, which required a landfill cap as part of the remediation process, habitat was enhanced. Because the landfill cap could not have any deep penetrating vegetative root systems, only grass species could be planted. The cap area and the adjacent 30-acre soil borrow area used to construct the cap have been restored to a grassland/prairie habitat, a type of habitat on the decline on Whidbey Island. The cleanup team was able to design these types of wetland and grassland habitats to enhance local bird populations in support of the Department of Defense initiative "Partners In Flight."

One innovative technology successfully applied at the air station was the use of low-flow groundwater sampling strategies at an abandoned landfill. Quantitative sampling results from the groundwater wells located around the landfill were obtained. Previously, the method for taking samples stirred up sediment and muddied the water, thereby distorting the analysis of the sample. By using the low-flow sampling technique, water samples were taken slowly over an extended time frame. Accurate results from this technology indicated that the landfill did not require remediation.

The Navy has used other innovative concepts in its cleanup of NAS Whidbey Island including qualitative (versus quantitative) risk assessments, a focused Feasibility Study, a combined Remedial Investigation/Feasibility Study document, and a reader's guide to the Remedial Investigation/Feasibility Study document for the RAB and the community. All four expedited the cleanup process by streamlining the Navy's efforts and facilitating an efficient review of the Remedial Investigation/Feasibility Study by the Restoration Advisory Board.

NAS Whidbey Island was recognized for its outstanding environmental cleanup program by being awarded the Secretary of Defense Environmental Cleanup Award in 1995.

Restoring the Future...

The banding of Northern Harrier chicks at NAS Whidbey Island continues today from its origin in 1992 as part of an ecological risk assessment program. Local resident Megan Klope assists the Falcon Research Group of Seattle, Washington, in the annual banding program.